WHAT IS CLAIMED IS

1. A semiconductor photodetection device, comprising:

a semiconductor structure including an optical absorption layer having a photo-incidence surface on a first side thereof;

a dielectric reflecting layer formed on a second side of the semiconductor structure opposite to the first side;

a contact electrode surrounding the dielectric reflecting layer and contacting with the semiconductor structure; and

a close contact electrode covering the dielectric reflecting layer and contacting with the contact electrode and the dielectric reflecting layer, the close contact electrode adhering to the dielectric reflecting layer more strongly than to the contact electrode.

2. A semiconductor photodetection device, comprising:

a semiconductor structure including an optical absorption layer having a photo-incidence surface on a first side thereof;

a dielectric reflecting layer formed on a second side of the semiconductor structure opposite to the first side;

a contact electrode surrounding the dielectric reflecting layer and contacting with the semiconductor structure;

a dielectric coating layer surrounding the contact electrode; and

a close contact electrode covering the contact electrode and the dielectric coating layer and contacting with the contact electrode and the dielectric coating layer, the close contact electrode adhering to the dielectric coating layer more strongly than to the contact electrode.

3. A semiconductor photodetection device as claimed in claim 2, wherein said dielectric reflecting layer and said dielectric coating layer are made of fluoride, oxide or nitride including one or more atoms selected from the group consisting of Si, Al, Mg, Ti, Zr and Ta.

4. A semiconductor photodetection device, comprising:

a semiconductor structure including an optical absorption layer having a photo-incidence surface on a first side thereof;

a dielectric reflecting layer formed on a second side of the semiconductor structure opposite to the first side;

a contact electrode surrounding the dielectric reflecting layer and contacting with the semiconductor structure; and

a metal reflecting layer formed within a region inside the contact electrode;

wherein reactivity of the metal reflecting layer with the semiconductor material of the

semiconductor structure is lower than reactivity of the contact electrode with the semiconductor material.

5. A semiconductor photodetection device as claimed in claim 4, wherein said metal reflecting layer includes transition metal belonging to any group of groups 3A through 8A.

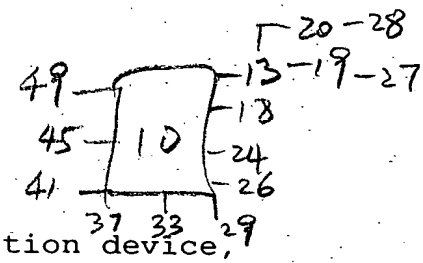
6. A semiconductor photodetection device as claimed in claim 5, wherein said metal reflecting layer includes one or more atoms selected from the group consisting of Pt, Ni, TiW and TiN.

7. A semiconductor photodetection device as claimed in claim 4, wherein said metal reflecting layer comprises a first metal reflecting layer having a thickness thinner than the absorption length at a signal light wavelength, and a second metal reflecting layer formed on the first metal reflecting layer.

8. A semiconductor photodetection device as claimed in claim 7, wherein said first metal reflecting layer includes transition metal belonging to any group of groups 3A through 8A and said second

metal reflecting layer includes transition metal belonging to group 1B or 2B.

9. A semiconductor photodetection device as claimed in claim 8, wherein said first metal reflecting layer includes one or more elements selected from the group consisting of Pt, Ni, TiW and TiN, and said second metal reflecting layer includes one or more atoms selected from the group consisting of Au, Ag and Cu.



10. A semiconductor photodetection device, comprising:

a semiconductor structure including an optical absorption layer (133) having a photo-incidence surface on a first side thereof;

a dielectric reflecting layer (136) formed on a second side of the semiconductor structure opposite to the first side;

a contact electrode surrounding the dielectric reflecting layer and contacting with the semiconductor structure;

a barrier electrode (138) formed on the periphery of the dielectric reflecting layer (136); and

a reflecting electrode covering the dielectric reflecting layer (136) and contacting with the barrier electrode (138) and the dielectric reflecting layer.

11. A semiconductor photodetection device as claimed in claim 1, wherein said dielectric reflecting layer is made of fluoride, oxide or nitride including one or more atoms selected from the group consisting of Si, Al, Mg, Ti, Zr and Ta.

12. A semiconductor photodetection device as claimed in claim 2, wherein said dielectric reflecting layer is made of fluoride, oxide or nitride including one or more atoms selected from the group consisting of Si, Al, Mg, Ti, Zr and Ta.

13. A semiconductor photodetection device as claimed in claim 10, wherein said dielectric reflecting layer is made of fluoride, oxide or nitride including one or more atoms selected from the group consisting of Si, Al, Mg, Ti, Zr and Ta.

14. A semiconductor photodetection device as claimed in claim 1, wherein said close contact electrode is made of Ti or Al.

15. A semiconductor photodetection device as claimed in claim 2, wherein said close contact electrode is made of Ti or Al.

16. A semiconductor photodetection device as claimed in claim 1, further comprises one or more additional reflecting layers made of a dielectric or semiconductor material on the dielectric reflecting layer.

17. A semiconductor photodetection device as claimed in claim 2, further comprises one or more additional reflecting layers made of a dielectric or semiconductor material on the dielectric reflecting layer.

18. A semiconductor photodetection device as claimed in claim 10, further comprises one or more additional reflecting layers made of a dielectric or semiconductor material on the dielectric reflecting layer.

19. A semiconductor photodetection device as claimed in claim 13, wherein said additional reflecting layers are dielectric layers comprising fluoride, oxide or nitride including one or more atoms selected from the group consisting of Si, Al, Mg, Ti, Zr and Ta, or semiconductor layers including Si or Ge.

20. A semiconductor photodetection device as claimed in claim 13, wherein said dielectric reflecting layer has a refractive index of n_1 and said additional reflecting layers have a refractive index of n_2, where $n_2 > n_1$.

21. A semiconductor photodetection device as claimed in claim 14, wherein said dielectric reflecting layer has a refractive index of n_1 and said additional reflecting layers have a refractive index of n_2, where $n_2 > n_1$.

22. A semiconductor photodetection device as claimed in claim 1, wherein said close contact electrode performs at least partially a function of reflecting incident light.

23. A semiconductor photodetection device as claimed in claim 2, wherein said close contact electrode performs at least partially a function of reflecting incident light.

24. A semiconductor photodetection device as claimed in claim 10, wherein said additional reflecting electrode includes transition metal belonging to group 1B or 2B.

25. A semiconductor photodetection device as claimed in claim 17, wherein said additional reflecting layer includes one or more atoms selected from the group consisting of Au, Ag and Cu.

26. A semiconductor photodetection device as claimed in claim 10, wherein said metal reflecting layer comprises a first metal reflecting layer having a thickness less than the absorption length for a wavelength of an optical signal, and a second metal reflecting layer formed on the first metal reflecting layer.

27. A semiconductor photodetection device as claimed in claim 19, wherein said first metal reflecting layer includes transition metal belonging to any of groups 3A through 8A and said second metal reflecting layer includes transition metal belonging to group 1B or 2B.

28. A semiconductor photodetection device as claimed in claim 20, wherein said first metal reflecting layer includes one or more elements selected from the group consisting of Pt, Ni, TiW and TiN, and said second metal reflecting layer includes one or more atoms selected from the group consisting of Au, Ag and Cu.

29. A semiconductor photodetection device as claimed in claim 10, wherein said barrier electrode has a larger area than the contact electrode.

30. A semiconductor photodetection device as claimed in claim 1, wherein said contact electrode is of a ring shape.

31. A semiconductor photodetection device as claimed in claim 2, wherein said contact electrode is of a ring shape.

32. A semiconductor photodetection device as claimed in claim 4, wherein said contact electrode is of a ring shape.

33. A semiconductor photodetection device as claimed in claim 10, wherein said contact electrode is of a ring shape.

34. A semiconductor photodetection device as claimed in claim 1, wherein said contact electrode is formed partially surrounding the dielectric reflecting layer.

35. A semiconductor photodetection device as claimed in claim 2, wherein said contact electrode is formed partially surrounding the dielectric reflecting layer.

36. A semiconductor photodetection device as claimed in claim 4, wherein said contact electrode is formed partially surrounding the dielectric reflecting layer.

37. A semiconductor photodetection device as claimed in claim 10, wherein said contact electrode is formed partially surrounding the dielectric reflecting

layer.

38. A semiconductor photodetection device as claimed in claim 1, wherein said semiconductor structure is mounted on a semiconductor substrate and the photo-incidence surface is placed on the substrate side of the semiconductor structure.

39. A semiconductor photodetection device as claimed in claim 2, wherein said semiconductor structure is mounted on a semiconductor substrate and the photo-incidence surface is placed on the substrate side of the semiconductor structure.

40. A semiconductor photodetection device as claimed in claim 4, wherein said semiconductor structure is mounted on a semiconductor substrate and the photo-incidence surface is placed on the substrate side of the semiconductor structure.

41. A semiconductor photodetection device as claimed in claim 10, wherein said semiconductor structure is mounted on a semiconductor substrate and the photo-incidence surface is placed on the substrate side of the semiconductor structure.

42. A semiconductor photodetection device as claimed in claim 1, wherein said semiconductor structure is mounted on a semiconductor substrate and the photo-incidence surface is placed on a side opposite to the substrate of the semiconductor structure.

43. A semiconductor photodetection device as claimed in claim 2, wherein said semiconductor structure is mounted on a semiconductor substrate and the photo-incidence surface is placed on a side opposite to the substrate of the semiconductor structure.

44. A semiconductor photodetection device as claimed in claim 4, wherein said semiconductor structure is mounted on a semiconductor substrate and the photo-incidence surface is placed on a side opposite to the substrate of the semiconductor structure.

45. A semiconductor photodetection device as claimed in claim 10, wherein said semiconductor structure is mounted on a semiconductor substrate and

the photo-incidence surface is placed on a side opposite to the substrate of the semiconductor structure.

46. A semiconductor photodetection device as claimed in claim 1, wherein said semiconductor structure further includes a carrier-multiplier layer, and said semiconductor photodetection device is an avalanche photodiode.

47. A semiconductor photodetection device as claimed in claim 2, wherein said semiconductor structure further includes a carrier-multiplier layer, and said semiconductor photodetection device is an avalanche photodiode.

48. A semiconductor photodetection device as claimed in claim 4, wherein said semiconductor structure further includes a carrier-multiplier layer, and said semiconductor photodetection device is an avalanche photodiode.

49. A semiconductor photodetection device as claimed in claim 10, wherein said semiconductor structure further includes a carrier-multiplier layer,

and said semiconductor photodetection device is an avalanche photodiode.